



Abstract

The golf club head evaluation system provides two methods for evaluating and comparing various club head designs. Method one is a data acquisition apparatus that captures, processes, and displays the bending and torsional deflections and accelerations of a golf club shaft in response to impact loads applied to an attached golf club head. Method two provides a graphical method for comparing the inertia properties of golf club heads based upon equivalent inertia ellipsoids. The apparatus contains an instrumented shaft that is supported in a cantilevered position. Golf club heads of various configurations are attached to the end of the shaft. Their graphical images and mass properties are input to the computer. From the mass property data, an ellipsoid is created with equivalent mass properties. The club head graphical images are presented to the user with superimposed equivalent inertia ellipsoids that facilitate direct comparison of mass properties among different club heads, and for determining desired impact locations. Magnitude and location variable impact loads are applied to the club head by a falling steel ball. The shaft is attached to a rigid steel frame and instrumented with strain gauges configured in a Wheatstone half-bridge arrangement, and with a three-axis accelerometer. The data acquisition system is triggered by the falling ball passing through a light beam. A strain gauge data acquisition board in a central processing unit records strain information. An oscilloscope records data from the accelerometer. A set of computer programs collect strain gauge and accelerometer readings from the shaft, processes and stores the data, and plots the data on a computer screen. Plots include impact induced deflections and accelerations for central and eccentric impact loads, measured in different angular and linear directions. From the experimental data and the

equivalent inertia ellipsoids, and the relative merits of various club head designs can be determined and compared.